THE RELATION BETWEEN INTELLIGENCE AND SPEED PERFORMANCE IN TYPEWRITING OF BOYS AND GIRLS ENROLLED IN TYPEWRITING I IN UNIFIED SCHOOL DISTRICT NO. 223 BARNES, KANSAS 1968-69

by

CAROLYN A. KOBUSZEWSKI

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Floyd H. Price

Major Professor

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CHAPTER I

THE PROBLEM AND DEFINITIONS OF TERMS USED

Although this is not as prevalent as it has been in the past, typewriting is often seen as an inferior part of the over-all school curriculum. In fact, it has often been considered and utilized as a dumping ground for low-ability or low-achievement students who seemingly did not fit into the "traditional" area of a school program. Due primarily to this thinking, the need was felt to analyze what relationship, if any, existed between intelligence scores and speed performance of the students enrolled in the Typewriting I course offered at the two high schools located in Unified School District No. 223, Barnes, Kansas.

I. THE PROBLEM

Statement of the problem. This study was designed to determine the relationship, if any, between intelligence scores and speed performance in beginning typewriting. The null hypothesis was stated as follows:

> H_0. There is no significant relationship between intelligence scores as measured by The Primary Mental Abilities Test: Intermediate[1], and speed performance in Typewriting I as measured by a series of straight-copy tests given periodically during the course year.

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[1] L. L. Thurstone and Thelma Gwinn Thurstone, Primary Mental Abilities Technical Report (Chicago: Science Research Associates, Inc., 1965), p. 1.

Importance of the study. The relationship between intelligence scores and typewriting speed performance has merited investigation due primarily to the current thinking that typewriting is an inferior part of the over-all school curriculum. In addition, it was hoped that the statistical analysis would give to the typewriting teacher valuable insights into the analysis of speed performance done by typewriting students.

II. DEFINITIONS OF TERMS USED

To enable the reader to more readily understand the data and findings set forth in this tudy, the following terms are defined:

Error cut-off. This limit was a fixed error ceiling of five errors on each of the straight-copy timings. The students figured their speeds on the basis of the words they had typed before making their first excessive error, which would have been the sixth error.

Gross words a minute (gwam). This term means that no error penalty in deducted before total words are divided by the minutes spent in the timed writing. In this study, total words were counted up to the error cut-off. The students counted the number of words they typed. Every five strokes counted as one word. They divided the total by the number of minutes in the timing, three, four or five. The result is the student's words a minute (wams).

Intelligence scores. These scores refer to the results of administering The Primary Mental Abilities Test: Intermediate to the students involved in the study.[2] The abbreviation I.Q. will be used throughout this study.

Net words a minute (nwam). A unit of typewriting measurement involving the deduction of a set number of words penalty for each error made during the timing before dividing the total standard five-stroke words typed by the time allowed is called net words a minute.

Primary Mental Abilities Test: Intermediate. This test is an intelligence test designed to provide multi-factored as well as general indices for intermediate grade levels nine through twelve. The test battery measures verbal meaning, number facility, reasoning, and spatail relations.[3] The abbreviation PMA will be used throughout this paper.

Straight-copy tests. Achievement tests, taken from the typewriting textbook adopted at Hanover High School, designed to measure skill, stamina, and persistence in the typewriting process are termed straight-copy tests.

Typewriting I. This is the title given to the first year course of typewriting at Hanover High School and Linn High School of Unified School District No. 223. The primary objective of the course

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[2] Ibid., p. 3.

[3] Ibid., p. 5.

is that the student achieve a definite degree of skill in performing certain typewriting tasks, especially straight-copy speed and accuracy. As a skill subject, it emphasizes doing rather than knowing.

III. LIMITATIONS OF THE STUDY

Environmental factors, both material and social, motivation, teacher verbalization, student interest and attitude, growth rates and past experience account for variations in speed performance in the students of Hanover High School and Linn High School.

This study has the following limitations:

1. The study was conducted at the two high schools located in Unified School District No. 223, Barnes, Kansas, during the 1968-1969 school year.

2. Hanover High School had an enrollment of 177 students and is located in a rural farming community situated in the northeast corner of the unified school district in north-central Kansas.

3. Linn High School, located at the west end of the district, is also a rural farming community. It had a total enrollment of 187 students.

4. All of the individuals participating in the study were students enrolled in the Typewriting I course of the two schools. There was no stratification of the students involved.

5. The students were informed that the study would take place during the 1968-1969 school year, but they were unaware of the specific testing sessions.

6. The Linn High School commerce teacher is a male with nine years' teaching experience. He administered all of the typewriting tests to his classes.

7. The Hanover High School commerce teacher, the writer, is a female in her first year of teaching. She administered all of the typewriting tests to her classes.

8. The Hanover High School counselor administered the PMA test in both high schools.

9. The scores of fourteen girls and eighteen boys participating in the study were eliminated from the final analysis due to absenteeism on some testing dates. The writer felt that since the test material was in circulation following each test, some of the students absent would have had an advantage if they had been allowed to take the test later.

The writer compared the speed performance test scores with the intelligence scores, which are not an exact measure of the student's intelligence. These scores are only an estimation of the student's intelligence on a certain day. The comparison was calculated on a computer.

CHAPTER II

REVIEW OF LITERATURE

A great number of research attempts have been made in the area of motor learning as it relates to intelligence scores. However, very few studies have been conducted in business sectors, be they management or education, concerning speed performance in typewriting as it relates to intelligence scores. A summary of the work done on problems related to this study follows.

Stroop, in developing her article on typewriting research, pointed out that the current studies done in this area do not show intelligence tests as a predictive measure of success in typewriting. However, she did conclude that an important factor in the interpretation of test scores is the use of intelligence tests. Still later, she implied that students with high intelligence scores tend to become better typists than do those students with low intelligence scores.[1]

An investigation by Fitch showed that business research is badly needed because learning theories indicate that even the most fundamental typewriting practices need to be scrutinized. The author also pointed out that a student must possess intellectual maturity in addition to physical maturity if effective learning is to take place.[2]

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[1]Christine Stroop, "Research Conclusions for Teaching Typewriting," Journal of Business Education, 29:18-19, May, 1954.

[2]Stanley K. Fitch, "Some Implications of Modern Theories of Learning for Research Typewriting," Journal of Business Education, 35:66-68, November, 1959.

Fuller studied the reading factors involved in typewriting. Although he did not treat the intelligence factor of typewriting directly, his findings concerning reading habits are significant and may yet be utilized in studies to determine the relationship between intelligence and motor skills. In his unpublished thesis, Fuller stated that intelligence is not an important factor in typewriting because the meaning of the words are not involved in typewriting.[3]

On the other hand, Wood said intelligence may not seem to be too important in typewriting, but it does play a role in reading, and this degree of intelligence is the strongest single factor in pupil success in reading.[4]

Florence Foss performed a limited study similar to the one explained here. It was also done on a small scale. In the analysis, intelligence scores were found to be closely related to individual speed performance.[5]

Huffman and Bell based a related study upon general typewriting ability and upon the typewritability of the material copied. They concluded that typewriting ability depended upon the student's interest, intelligence, manual dexterity, and coordination in typewriting.[6]

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[3]Donald C. Fuller, "Reading Factors in Typewriting," (Unpublished thesis, Harvard University, 1943), p. 43.

[4]Jerry L. Wood, "Reading and Typewriting," Journal of Business Education, 40:45-46, December, 1964.

[5]Florence Foss, "Do Reading Scores Predict Typing Success," Journal of Business Education, 41:18-19, April, 1966.

[6]Harry Huffman and Mary L. Bell, "Measuring Typewritability," Journal of Business Education, 3:15-16, November, 1949.

Hetrick A. Foss, after his two-year study of 168 Sarasota, Florida Junior High School typewriting students, stated that speed performance is almost directly related to intelligence. On the basis of intelligence scores secured through the use of the Henmon-Nelson Test of Mental Ability and the Stanford Achievement Test battery, Foss concluded that students having an intelligence score of ninety or less on the Henmon-Nelson test and/or scoring two years or more below grade level as indicated by the battery median of the Stanford test will not master the mechanics of the beginning typewriting course in general.[7]

The study indicated further that higher-intelligence and battery-median score students will practically monopolize the better grades, while lower-intelligence and/or battery-median students will obtain the lower grades. Foss stated further that grouping by either intelligence or battery median scores will give almost identical over-all predictability of class results.[8]

In Foss' study, performance was measured by grading periods (four nine-week sessions) and included over-all academic grades, as well as a breakdown into their component parts. Three ten-minute timings at twenty or more words a minute (wams) with a five-error maximum and a net words a minute (nwams) ten-word penalty for each

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[7]Hetrick A. Foss, "How Does Intelligence Affect Typing Performance?" Business Education World, 41:24-25+, October, 1963.

[8]Ibid., p. 24.

error were the minimum requirements for the performance tests. Grading was based upon speed, accuracy, production, technique, quizzes, classwork, participation, and spelling.[9]

Foss found the boys and girls to be equally adept, with the girls scoring five words a minute higher than the boys: girls, 32.09; boys, 27.36 wams. The four top speeds were made by girls, and seven of the top ten speeds were typed by girls.[10]

Of the seventeen students scoring below 90 on the Henmon-Nelson test, fourteen failed by the production speed method of grading. Of the sixteen students obtaining a score below the 6.7 battery median of the Stanford test, fifteen failed by the production speed method. Of the eighty-two boys involved in the study, twenty-nine failed by the speed method of grading; of the eighty-six girls involved, twenty-nine failed in speed according to the evaluation procedures used by Foss.[11]

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[9] Ibid., p. 25.

[10] Ibid., p. 33.

[11] Ibid.

CHAPTER III

PROCEDURE

Type of Study

A correlational study involving the boys and girls enrolled in the Typewriting I classes at Hanover High School and Linn High School was designed.

Correlational studies include all of those research projects in which an attempt is made to discover or clarify relationships through the use of correlation coefficients. The correlation coefficient is a numerical index which expresses statistically the relationship between two variables.[1] The magnitude of the index indicates the degree to which the two frequency distributions of data are related.

The Pearson Product-moment Correlation method of correlational analysis was used in this study.

Description of Sample

At the time of this study Unified School District No. 223 had an enrollment of 711 pupils. There were 347 students attending schools in the elementary system and 364 were enrolled in the secondary system.

There are two high schools (grades 9 through 12), Hanover High School and Linn High School. At the time of the study, the enrollment

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[1] Jimmy R. Amos and others, Statistical Concepts: A Basic Program (New York: Harper and Row, Publishers, 1965), pp. 59-64.

for the Hanover High School was 177, and the school was staffed with 13 teachers. Linn High School had a total enrollment of 187 pupils and 18½ teachers.

The students participating in the study included all students enrolled in a Typewriting I class at either high school, except for fourteen girls and eighteen boys, who were eliminated due to absenteeism on testing dates. Of the total sampling, 34.4 percent of the students tested were above average in I.Q.; 24.6 percent were average, and 41 percent were below average according to the results of the PMA test. Above average intelligence was considered 110+; average intelligence, 90-109; below average intelligence, 89-.

A description showing the relationship between the I.Q. scores and typewriting test scores as computerized are found in Tables I and II. Table I gives a description of the sample used in this study. Table II shows a correlational summary of the results of the study.

Measuring Devices

The SRA Primary Mental Abilities Test: Intermediate is designed to provide both multi-factored and general measures of intelligence. It aids counselors and teachers in evaluating, understanding, and interpreting the individual differences in behavior and performance among children who appear to be of comparable intelligence.[2]

The four primary mental abilities measured by the PMA test are the following: 1) verbal meaning, 2) number facility, 3) reasoning, and 4) spatial relations. The total score of the PMA test--the

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[2]Science Research Associates, PMA Primary Mental Abilities (Examiner's Manual for Grades 9-12), p. 3.

TABLE I

RANKING OF INDIVIDUAL STUDENTS ACCORDING TO I.Q. WITH TYPEWRITING TEST SCORES

STUDENT NO.	SEX*	IQ**	TYPEWRITING TESTS I	II	III	IV	V	VI
50	0	157	25	38	38	40	36	41
46	1	141	22	9	30	36	16	42
43	0	140	34	20	39	43	51	48
48	0	140	35	43	34	48	35	35
57	0	130	30	20	56	50	56	50
54	1	129	16	15	28	22	28	29
55	1	127	19	26	28	34	34	37
39	1	139	18	29	20	35	31	38
38	0	128	25	31	44	39	36	51
45	0	128	36	47	56	56	70	69
31	1	126	22	30	48	45	50	46
19	0	125	25	43	48	53	51	53
32	0	123	31	11	39	40	11	42
34	0	120	25	33	39	42	41	40
42	0	120	24	25	39	43	42	45
52	1	118	19	22	31	5	34	26
37	1	117	19	28	24	32	36	40

* 0 - female; 1 - male

** 110+ above average I.Q.; 90-109 average I.Q.; 89- below average I.Q.

TABLE I (CONT.)

STUDENT NO.	SEX*	IQ**	TYPEWRITING TESTS I	II	III	IV	V	VI
49	1	117	16	22	30	19	23	33
27	1	115	17	21	33	31	29	36
61	1	115	17	22	22	28	27	30
60	1	111	20	28	34	28	35	41
15	1	104	25	27	38	13	39	33
26	0	102	23	27	38	39	30	23
58	1	102	24	24	25	14	21	33
47	0	101	25	16	35	12	14	35
51	1	101	20	28	16	28	35	34
44	1	99	16	25	32	23	33	34
41	0	98	21	17	29	31	35	40
23	1	97	15	21	32	32	35	30
8	1	95	16	20	25	26	24	28
28	1	95	17	19	25	30	18	37
2	1	94	21	17	30	31	38	46
13	0	94	25	33	27	35	39	18
29	1	93	16	25	26	31	29	33
25	0	92	25	27	37	40	36	41
17	1	91	23	26	35	26	30	45
24	0	89	24	36	24	42	42	34

* 0 - female; 1 - male

** 110+ above average I.Q.; 90-109 average I.Q.; 89- below average I.Q.

TABLE I (CONT.)

STUDENT NO.	SEX*	IQ**	TYPEWRITING TESTS I	II	III	IV	V	VI
14	0	88	24	30	20	37	37	34
18	0	87	20	23	34	29	37	44
36	1	86	19	21	35	26	19	33
9	0	84	16	15	19	5	21	13
33	1	84	14	22	27	32	30	36
3	0	83	25	26	35	42	41	48
7	0	83	19	29	30	32	43	41
30	0	81	24	33	40	43	39	41
40	0	81	27	9	28	12	21	29
16	0	80	16	20	21	24	25	27
22	1	79	15	19	18	21	31	29
4	0	79	19	27	20	33	26	28
10	1	77	15	26	26	24	29	28
56	1	76	22	14	29	14	26	30
20	0	74	13	17	23	26	13	23
6	0	71	31	23	52	48	53	50
12	1	70	20	22	25	26	16	30
53	1	69	17	15	18	31	32	15
35	0	59	25	33	33	40	37	41
11	0	58	16	17	18	37	13	26

* 0 - female; 1 - male

** 110+ above average I.Q.; 90-109 average I.Q.; 89- below average I.Q.

TABLE I (CONCLUDED)

STUDENT NO.	SEX*	IQ**	TYPEWRITING TESTS I	II	III	IV	V	VI
59	1	56	12	23	15	18	25	26
5	0	49	27	31	38	41	42	39
1	1	41	17	26	31	28	40	38
21	0	36	20	16	16	25	20	29

* 0 - female; 1 - male

** 110+ above average I.Q.; 90-109 average I.Q.; 89- below average I.Q.

TABLE II

CORRELATIONAL SUMMARY*

TEST	TYPEWRITING TESTS I	II	III	IV	V	VI
SEX**	-.4432	-.1970	-.2507	-.3793	-.1899	-.1505
VERB	.4031	.2441	.4444	.3470	.3000	.4712
NUMB	.3998	.2379	.3368	.2343	.2182	.2966
REAS	.5501	.4919	.4724	.4802	.3946	.5298
SPAT	.2698	.2014	.3698	.2230	.2370	.3234
I.Q.	.4790	.3573	.5101	.3893	.3582	.5020

* Either a positive or negative Pearson Product-moment correlation coefficient having an absolute magnitude equal to or greater than about .34 is a significant one.

** Negative correlation (-) indicates female students tended to score higher.

intelligence score--satisfied the need for an index of general intelligence.

The straight-copy speed performance tests were obtained from the typewriting textbook used at the Hanover center.[3] The unpreviewed timings were selected for the purpose of evaluating the speed performance of each pupil at six-weeks intervals in the Typewriting I course. The typewriting material was copy controlled by the authors of the textbook--that is, the typing difficulty of the material was manipulated so that the material abetted the skill development of the student up to the testing date.

It should be noted that the first typewriting test was composed of two three-minute timed writings. The second test was composed of two four-minute timed writings. The time limits of these tests were due to the fact that the students were not yet able to maintain the durability of their acquired skill for a longer period of time. All students were, however, allowed the same five-error cut-off on these first two tests. All of the remaining typewriting tests were five minutes in length with the five-error cut-off.

Description of Procedure

The pupils participating in the study included sixty-one boys and girls of Hanover High School and Linn High School. The students included fifty-seven sophomores, three juniors, and one senior, all of whom were enrolled in a Typewriting I class. A description of the sample may be gleaned from Table I. The test scores of thirty-one girls and thirty boys were used in the study. There was no sorting or shifting

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[3]John L. Rowe and others, Gregg Typing 191 Series, Book One: General Typing (New York: McGraw-Hill Book Company, Gregg Division, 1962).

of the students involved, and no student was turned away because of lack of performance, ability or for any other reasons.

The Primary Mental Abilities Test: Intermediate was administered by the Hanover High School counselor near the beginning of the school term in both schools. The test took approximately two fifty-minute periods for which typewriting classtime was provided.

The students were informed at the beginning of the school term that the study would take place during the 1968-1969 school year, but they were unaware of the specific testing sessions of the study. Consequently, grading was not a factor in the study except for the last testing session of the year when the straight-copy timing was administered along with the regularly scheduled examination given as an overall indication of the typewriting speed skills in both schools.

The commerce teacher at each high school administered the speed performance timings. Both teachers instructed the students to use the gross words a minute method of scoring at the five-error cut-off.

The Typewriting I classes were held during the fifth (12:45 - 1:40 p.m.) and seventh period (2:40 - 3:30 p.m.) each afternoon during the five-day school week. The Linn High School commerce teacher conducted both of the classes there, and the Hanover High School commerce teacher conducted both of the classes at that school. The Typewriting I course enrollment averaged twenty-three students per class.

The setting for the study was a conventional typewriting classroom--well ventilated and well lighted--at both high schools. Three well-known brands of manual and electric typewriters were used.

Each student was given an opportunity to type on both electric and manual types as well as all three brands of machines for six-weeks' periods.

The speed performance tests consisted of six straight-copy timed writings. The tests were administered at the end of each six-weeks' interval approximately. The students were given a reasonable warmup period prior to the test. The teacher read the test directions while the students followed along in their copies.

Each testing session consisted of two timed writings. The students proofread each timed writing to the five-error cut-off. The students then computed their speed on the basis of the number of words they had typed before they made the sixth error. This scoring procedure is known as the five-error cut-off approach to scoring a timed writing. Each commerce teacher checked samples of the scoring done by his/her pupils.

The Primary Mental Abilities Test: Intermediate was given to all of the students enrolled in Typewriting I except those absent the days the test was administered. The Hanover High School counselor administered the test at both schools. The writer scored the tests working with the Hanover High School biology instructor.

Method of Analysis

The writer punched the scores of the six straight-copy timed writings, the four primary mental abilities subtests scores, the total PMA I.Q. test score, and the sex of the individual students on cards using a 026 key-punch machine located at the Kansas State University Computing Center.

A computer was programmed to analyze the data. Using the means of the sets of scores, the correlation was computed via the Pearson Product-moment correlation for variables for the sample as a whole. The data from the computer did not identify the individual student.

The writer selected the .01 level of significance to determine any significant relationships between intelligence and speed performance. This level of significance (in this case .01) is the probability of arriving at a certain type of erroneous conclusion...in this instance, the probability that one will conclude there is a relationship between the two variables, when in fact no such relationship exists. Since the sample for this study totalled sixty-one, the writer felt the .01 level of significance to be a conservative one. The critical value of the correlation coefficient is .34. The level of significance is .01.

CHAPTER IV

ANALYSIS OF THE RESULTS

An over-all view of the composition of the sample may be found in tabular form in Table I. Table I shows the number of students involved in this study in the order of their total I.Q. scores. Where there is a tie in I.Q. scores, the students concerned are arranged in alphabetical order. The sex is also indicated. Each student's speed performance on the six speed performance tests is also found in this Table.

Table II gives a description of the entire group as calculated by the computer.

A two-tailed test at the .01 level of significance was used to test the hypothesis of no relationship between the variables recorded in the study. In every case, a t-test of the hypothesis of zero correlation was used. Under these circumstances, either a positive or negative Pearson Product-moment correlation coefficient having an absolute magnitude equal to or greater than about .34 is a significant one. The Pearson Product-moment correlation formula is the following:[1]

$$r = \frac{\Sigma xy}{\sqrt{\Sigma x^2 \cdot \Sigma y^2}}$$

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[1]John T. Roscoe, Fundamental Research Statistics, New York: Holt, Rinehart, and Winston, 1969), pp. 205-207.

Figure 1 graphically presents the correlation between the students' intelligence scores and each of the six typewriting test scores. Using a two-tailed test at the .01 level, a correlation coefficient equal to or greater than .34 is statistically significant. The relationship in this instance is significant for all six typewriting tests. The conclusion is that students with higher I.Q. scores consistently score higher on the typewriting tests.

The same general conclusions were derived from a study of the relationship of the subtest scores of the PMA test to typewriting test scores; however, not all of the correlation coefficients were statistically significant.

The scores on the reasoning tests, as graphically shown in Figure 2, were at all points significantly and positively related to the scores on the typewriting tests.

Scores on other sections of the PMA test were occasionally significantly and positively related and sometimes nonsignificant. The same was true with respect to the relationship between the sex of the student and the typewriting test scores, with girls tending to score higher than boys but not consistently so. This relationship is graphically illustrated in Figure 3.

Figure 4 shows the graphic relationship between verbal meaning test scores and typewriting test scores for the group tested. It is important to note that the typewriting test scores were not significantly related to verbal meaning test scores on the second (.2441) and fifth (.3000) typewriting tests, and that the correlation was barely a significant one on the fourth (.3470) typewriting test.

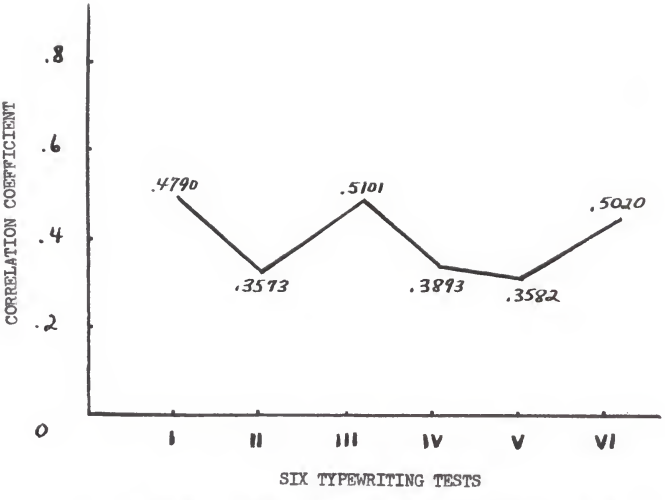

Figure 1. Relationship between intelligence scores and typewriting test scores.

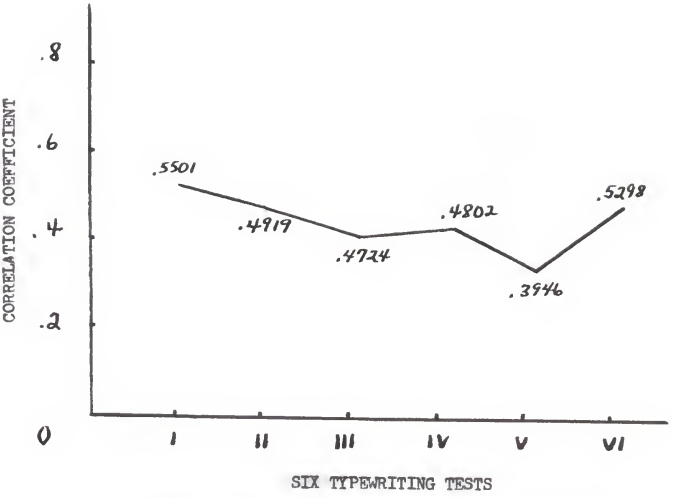

Figure 2. Relationship between reasoning scores and typewriting test scores.

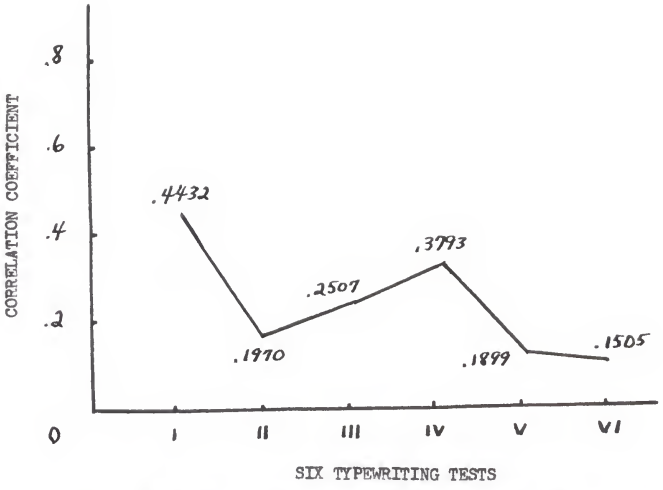

Figure 3. Relationship between sex and typewriting test scores.

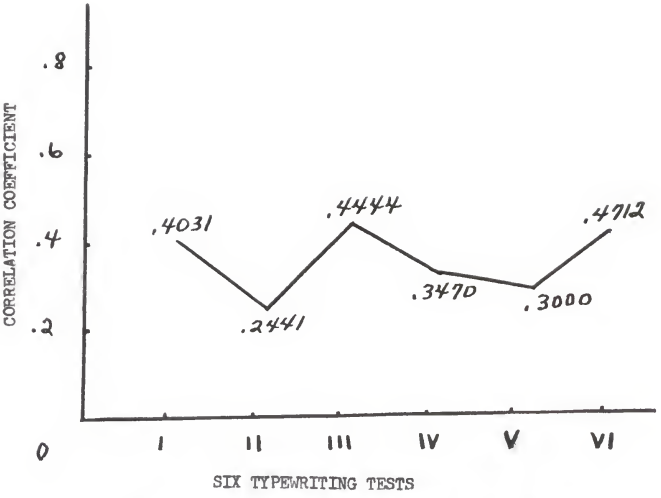

Figure 4. Relationship between verbal meaning scores and typewriting test scores.

In Figure 5 the null hypothesis was accepted almost consistently except in the case of the correlation between numerical facility test scores and the first typewriting test scores where the correlation coefficient was .3998. At this point in the course, the students had just learned the number keys on the typewriter keyboard and were genuinely aware of the number keys as the typewriting test material included several numbers. None of the other test timings included numerical characters.

Upon testing the relationship between spatial relations subtest scores and the six typewriting test scores, the hypothesis--that there was no significant relationship between intelligence scores as measured by the Primary Mental Abilities Test: Intermediate and speed performance in Typewriting I as measured by a series of straight-copy tests given periodically during the course year--was accepted with one exception. This exception on the spatial relations subtest occurred with the third typewriting test where the correlation coefficient was indicated to be .3698. This correlation coefficient of .3698 seemed to be much higher than the other correlation coefficients in this subtest area. There seemed to be no apparent reason for this result. The PMA subtest of spatial relations was designed to measure the student's ability to visualize objects and figures rotated in space and the relations between them. It is possible that the placement of a repeated word or words in the typewriting test material accounted for the significant relationship. Figure 6 illustrates graphically the relationship of the two variables--spatial relations and typewriting test scores.

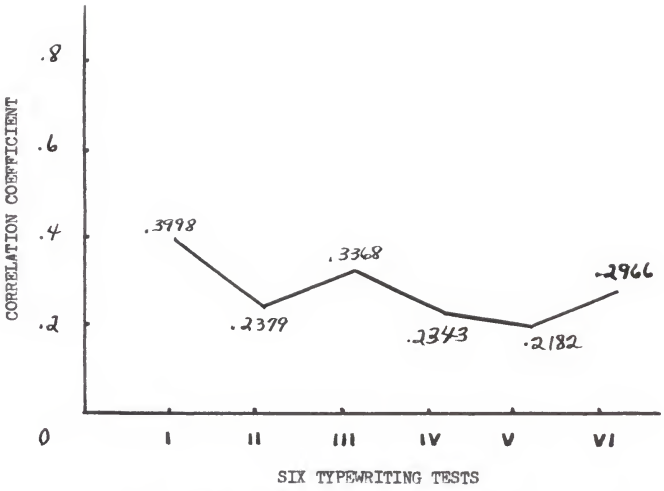

Figure 5. Relationship between number facility scores and typewriting test scores.

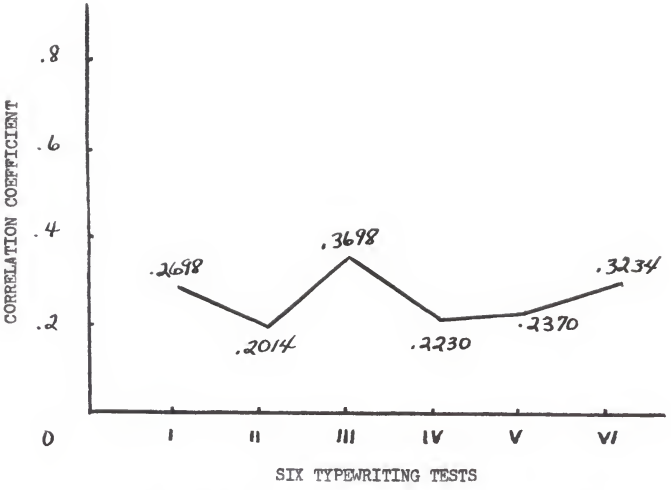

Figure 6. Relationship between spatial relations scores and typewriting test scores.

The highest relationship in the study was found to be between the reasoning subtest scores and the first typewriting test scores, .5501. It is most likely due to the fact that the students had to reason carefully to remember where each key is located. At this early date in the course, the key locations were not found to be totally automatic.

Since this study included students who were mostly average and above on the test of mental ability, Table I in Chapter III, and since there was a high relationship between the total intelligence scores as compared with the six typewriting speed performance tests, one could conclude that brighter students tend to think and react more quickly when learning to type than students with lower intelligence as measured by the Primary Mental Abilities Test: Intermediate.

CHAPTER V

SUMMARY AND CONCLUSIONS

Typewriting has often been seen as an inferior part of the over-all school curriculum. In fact, it has often been utilized as a dumping ground for low-ability or low-achievement students.

Due primarily to this thinking, the need was felt to analyze what relationship existed between intelligence scores and the speed performance of students enrolled in a beginning typewriting course in Unified School District No. 223, Barnes, Kansas.

Sixty-one boys and girls of Hanover High School and Linn High School were involved in the test. The students were given the Primary Mental Abilities Test: Intermediate and six periodical typewriting speed performance tests over straight-copy material.

Via computer, the writer used the Pearson Product-moment Correlation formula in comparing sex and the intelligence test scores with each one of the speed performance tests.

Although some of the literature indicated there was no positive relationship between intelligence and speed performance, this study rejected its hypothesis and indicated that there was a significant relationship on two out of the six correlations. See Figures 1 and 2 which are found in Chapter IV. Also see Table III on the following page.

A significant relationship was also found with respect to the other three I.Q. subtests; however, not all of these relationships were as consistent as that using the total I.Q. score. Subtest scores

TABLE III

CORRELATION OF I.Q. AND SPEED
PERFORMANCE SUMMARY

TYPING TEST	P*
I	.4790*
II	.3573*
III	.5101*
IV	.3893*
V	.3582*
VI	.5020*

* - Significant at the .01 level.

of the I.Q. test were, on occasion, significantly and positively related and sometimes nonsignificant.

Typewriting test scores were not significantly related to verbal meaning test scores on the second and fifth typewriting tests, and there was barely a significant relationship between the fourth typewriting test scores and verbal meaning test scores.

The null hypothesis was accepted almost consistely in the correlation between number facility test scores and typewriting speed performance test scores with the exception of the first typewriting test.

Upon testing the relationship between spatial relations test scores and the six typewriting test scores, the null hypothesis was accepted with one exception--the third typewriting test, where the placement of a repeated word or words may have accounted for the significant relationship.

With respect to the relationship between the sex of the student and the typewriting test scores, girls tended to score higher than boys but not consistently so.

The highest relationship in the study was found to be between the reasoning subtest scores and the first typewriting test scores, .5501.

The research done in this study seemed to indicate that there is a significant relationship between intelligence and some typewriting tests.

The writer suggests that further research be done using a very low I.Q. group, both sexes, and a very high I.Q. group, both sexes, following the same design of the study in an effort to discover whether there is a significant relationship between the sexes in speed performance in both groups.

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THE RELATION BETWEEN INTELLIGENCE AND SPEED PERFORMANCE IN TYPEWRITING OF BOYS AND GIRLS ENROLLED IN TYPEWRITING I IN UNIFIED SCHOOL DISTRICT NO. 223 BARNES, KANSAS 1968-69

by

CAROLYN A. KOBUSZEWSKI

B.A., Marymount College, 1968

AN ABSTRACT OF A MASTER'S THESIS

submitted in partial fulfillment of the
requirements for the degree

MASTER OF SCIENCE

College of Education

KANSAS STATE UNIVERSITY
Manhattan, Kansas

1969

ABSTRACT

The need was felt to analyze what relationship, if any, existed between intelligence scores and speed performance of the students enrolled in the Typewriting I course offered at the two high schools in Unified School District No. 223, Barnes, Kansas.

The study was designed to test the null hypothesis that there is no significant relationship between intelligence scores as measured by the Primary Mental Abilities Test: Intermediate, and speed performance in Typewriting I as measured by a series of straight-copy tests.

Sixty-one boys and girls at Hanover High School and Linn High School were involved in the testing. The Primary Mental Abilities Test: Intermediate was administered at the beginning of the school term by the Hanover High School counselor. The test was designed to measure verbal meaning, number facility, reasoning, and spatial relations in addition to providing total I.Q.

Six straight-copy typewriting tests were given--one every six weeks--to acquire the speed performance scores. The writer then used the Pearson Product-moment correlation via computer in comparing the five I.Q. scores and sex with each six weeks' typewriting test scores.

The results of the study indicated a consistently significant relationship between total I.Q. and the six typewriting test scores.

The same relation was found with respect to subtests of the PMA test. However, not all of the relationships noted were as consistent as that using the total I.Q. The reasoning scores were at all

points significantly and positively related to the typewriting scores. Scores on other sections of the PMA test were occasionally significantly and positively related and sometimes nonsignificant. The same was true with respect to the relationship between sex and the typewriting scores with girls tending the score higher than boys.

It was noted that verbal meaning scores and typewriting scores were not significantly related on two of the six tests, and that they were barely significantly related on one test. The null hypothesis was accepted almost consistently in the case of number facility except on the first typewriting test. The correlation between spatial relations test scores and typewriting test scores rejected the null hypothesis with one exception--the third test.

The hypothesis of no relationship between intelligence scores and typewriting speed performance was consistently rejected with students with higher I.Q. scores on the PMA test tending to receive higher speed scores on the typewriting tests. The research, therefore, indicated that there is a significant relationship between intelligence and some typewriting tests.